

What is claimed is:

1        1. A method of updating a cluster infrastructure version used by a group  
2        resident in a clustered computer system of the type including a plurality of nodes, the  
3        method comprising:

4                (A) updating the cluster infrastructure software in individual nodes in  
5                the clustered computer system while the group is maintained in an active state;

6                (B) after the cluster infrastructure software is updated, notifying the  
7                group of the update to the cluster infrastructure software; and,

8                (C) in response to the notification, dynamically updating a cluster  
9                infrastructure version used by the group to that of the updated cluster  
10          infrastructure software.

1        2. The method of claim 1, wherein the updated cluster infrastructure software  
2        includes at least one new function, whereby the group has access to the new function  
3        subsequent to dynamically updating the cluster infrastructure version used by the  
4        group.

1        3. The method of claim 1, further comprising notifying all groups resident in  
2        the clustered computer system after the cluster infrastructure software is updated.

1        4. The method of claim 1, wherein updating the cluster infrastructure software  
2        in an individual node comprises shutting down the node, installing cluster  
3        infrastructure software on the node, and restarting the node.

1        5. The method of claim 4, wherein shutting down the node includes removing  
2        a member that is resident on the node from the group and wherein restarting the node  
3        includes adding the member to the group.

1        6. The method of claim 1, wherein notifying comprises sending a ordered  
2        message to the group.

1                   7. The method of claim 6, wherein notifying comprises sending a membership  
2 change message with an adjust version reason code.

1               8. The method of claim 1, further comprising verifying that all nodes are  
2 active prior to notifying the group.

9. The method of claim 1, further comprising verifying that the group is not partitioned prior to notifying the group.

1                   10. The method of claim 1, further comprising verifying that all nodes are  
2 capable of running the updated cluster infrastructure version prior to notifying the  
3 group.

1           11. An apparatus comprising:

2               (A) a node configured to participate in a clustered computer system,  
3               the node having resident thereon cluster infrastructure software and at least  
4               one member of a group; and,

5               (B) program code resident in the node, the program code configured to  
6               notify the member of an update to the cluster infrastructure software, and to  
7               dynamically update a cluster infrastructure version used by the member to that  
8               of the updated cluster infrastructure software.

1           12. The apparatus of claim 11, wherein the updated cluster infrastructure  
2           software includes at least one new function, whereby the group has access to the new  
3           function subsequent to dynamically updating the cluster infrastructure version used by  
4           the node.

1           13. The apparatus of claim 11, wherein the notification is made using ordered  
2           messaging.

1           14. The apparatus of claim 13, wherein the notification is made via a  
2           membership change message with an adjust version reason code.

1           15. The apparatus of claim 11, wherein the program code is further configured  
2           to verify that the node is active prior to notifying the member and, if the node is not  
3           active, to return an error message.

1           16. The apparatus of claim 11, wherein the program code is further configured  
2           to verify that the group is not partitioned prior to notifying the member and, if the  
3           group is partitioned, to return an error message.

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- 1           17. The apparatus of claim 11, wherein the program code is further configured  
2       to determine whether the node is capable of running the updated cluster infrastructure  
3       software prior to notifying the member and, if the node is not capable of running the  
4       updated cluster infrastructure software, to return an error message.

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18. A program product, comprising:

(A) program code configured to reside on a node that participates in a clustered computer system and that further has resident thereon cluster infrastructure software and at least one member of a group, the program code configured to notify the member of an update to the cluster infrastructure software, and to dynamically update a cluster infrastructure version used by the member to that of the updated cluster infrastructure software; and,

(B) a signal-bearing medium bearing the program code.

19. The program product of claim 18, wherein the updated cluster infrastructure software includes at least one new function, whereby the group has access to the new function subsequent to dynamically updating the cluster infrastructure version used by the node.

20. The program product of claim 18, wherein the notification is made using ordered messaging.

21. The program product of claim 20, wherein the notification is made via a membership change message with an adjust version reason code.

22. The program product of claim 18, wherein the program code is further configured to verify that the node is active prior to notifying the member and, if the node is not active, to return an error message.

23. The program product of claim 18, wherein the program code is further configured to verify that the group is not partitioned prior to notifying the member and, if the group is partitioned, to return an error message.

- 1           24. The program product of claim 18, wherein the program code is further  
2        configured to determine whether the node is capable of running the updated cluster  
3        infrastructure software prior to notifying the member and, if the node is not capable of  
4        running the updated cluster infrastructure software, to return an error message.

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1           25. A cluster computer system, comprising:  
2               (A) a plurality of nodes, each having resident thereon cluster  
3               infrastructure software;  
4               (B) a group including a plurality of group members resident on the  
5               plurality of individual nodes; and,  
6               (C) program code resident on the plurality of nodes, the program code  
7               configured to shutdown and restart individual nodes among the plurality of  
8               nodes while maintaining the group in an active state so that the cluster  
9               infrastructure software resident on such individual nodes can be updated while  
10              such individual nodes are shutdown, the program code further configured to  
11              notify the group of the update to the cluster infrastructure software after the  
12              cluster infrastructure software has been updated in each of the plurality of  
13              nodes, and to dynamically update a cluster infrastructure version used by the  
14              group to that of the updated cluster infrastructure software.

1           26. The clustered computer system of claim 25, wherein the updated cluster  
2              infrastructure software includes at least one new function, whereby the group has  
3              access to the new function subsequent to dynamically updating the cluster  
4              infrastructure version used by the node.

1           27. The clustered computer system of claim 25, wherein the notification is  
2              made using ordered messaging.

1           28. The clustered computer system of claim 27, wherein the notification is  
2              made via a membership change message with an adjust version reason code.

1           29. The clustered computer system of claim 25, wherein the program code is  
2              further configured to verify that the node is active prior to notifying the member and,  
3              if the node is not active, to return an error message.

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1           30. The clustered computer system of claim 25, wherein the program code is  
2 further configured to verify that the group is not partitioned prior to notifying the  
3 member and, if the group is partitioned, to return an error message.

1           31. The clustered computer system of claim 25, wherein the program code is  
2 further configured to determine whether the node is capable of running the updated  
3 cluster infrastructure software prior to notifying the member and, if the node is not  
4 capable of running the updated cluster infrastructure software, to return an error  
5 message.

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